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KEY ACTIONS FOR CREATING FULL COMPETITION IN THE ICT SECTOR

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Key Actions for Creating Full Competition in the ICT Sector

This paper presents key actions for regulatory reform to reflect the opening of all sectors of the information and communications technology ("ICT") market to competition. This paper assumes that the Government of Azerbaijan will commit, as part of its accession to the World Trade Organization ("WTO"), to allow competition in all segments of the ICT market. It also assumes that Azerbaijan will incorporate the Reference Paper, a set of regulatory obligations, as part of its commitments in basic telecommunications services.

This paper discusses issues which are critical to the functioning of a competitive market once a monopoly has ended. It describes the most important regulatory changes required in order to promote competition in light of recent technological changes and potential WTO obligations.

This paper does not provide a sequence for the proposed changes but the Government of Azerbaijan should begin immediately to act. Many significant policy decisions must be made. Changes will require legislative action, adoption of new regulations, sophisticated economic analysis and collection or creation of data which does not exist today. These changes will take a number of years and cannot be done after WTO accession.

This paper does not address institutional changes that are required to promote a competitive market, such as what a government entity should be charged with licensing, addressing anti-competitive conduct and exercising enforcement authority. These types of changes are discussed in an accompanying paper on the creation of an independent regulatory authority. For purposes of this paper, the body exercising regulatory authority in the ICT sector is referred to as the "Regulator," without prejudice to where it is housed.

This paper sets the background for its recommendations with a discussion of the effects of technological changes on regulation. It then consists of the following sections with recommended actions:

Privatization and Foreign Ownership

The introduction of competition should proceed, regardless of the timing of privatization of state-owned operators.

Azerbaijan should separate Aztelecom and Baktelecom functionally from MCIT, including personnel and revenue.

Azerbaijan should maintain its openness to foreign investment and not limit ownership in the ICT sector.

Licensing

Azerbaijan should adopt a unified licensing system with three types of licenses:

- Individual network license -- to the extent that Aztelecom and Baktelecom enjoy monopoly rights, these should be specified in the individual network licenses

- Class license to provide services, requiring registration
- Individual spectrum license

The regulator should have the authority to approve registrations and issue all individual licenses and licenses assigning spectrum.

All the licenses should be subject to standard terms and conditions along the lines proposed by the European Union Directive.

General licenses should have no term; individual and spectrum licenses should have a term of 15 years.

Asymmetric Regulation and Competition Safeguards

The regulator and the Ministry of Economic Development Anti-Monopoly Office should reach an agreement dividing responsibilities.

The regulator should adopt a bright line test of 35 percent market share for application of asymmetric regulation.

The regulator should begin defining relevant markets, looking to the European Union market definitions as a substitute for a full-blown market analysis.

The regulator should designate Aztelecom and Baktelecom as “major suppliers” in the fixed line wholesale and retail markets, and mobile call termination market and begin analyzing their market share in the other markets.

The regulator should examine the market share of other operators to determine whether they exceed the 35% threshold.

The regulator should adopt rules prohibiting the types of anti-competitive activities, such as a requirement for accounting separation, prohibitions on improper use of confidential information, etc., which are not contained in the Anti-Monopoly Law.

As soon as adopted, the regulator should order Aztelecom and Baktelecom to institute accounting separation.

The Regulator should have the power to investigate and punish violations of the competition safeguards and other license terms/conditions through significant fines and ultimately license revocation.

Interconnection and Access in Competitive Markets

The regulator should require Aztelecom and Baktelecom to take the following actions:

- produce a RIO which will require developing a cost model
- make publicly available all information about interconnection to their networks
- make available all information about terms and conditions for accessing leased lines.

At a minimum, the regulator should issue interconnection rules regarding the last mile that address issues, such as interconnection points, cost-oriented rates, essential installations, physical collocation, though Azerbaijan could follow the European Union model and mandate local loop unbundling and bitstream access, as well.

The regulator should issue regulations on access to and use of PSTN by all service providers and attachment of equipment to the network, not just licensed operators that applies to all licensed operators and which requires public availability of information.

Management of Commercial Spectrum

The authority to assign radio spectrum should be transferred to the regulator, with the Frequency Council limited to allocating spectrum for broad uses.

Existing spectrum licenses should be amended to permit in-band migration without regulatory approval and spectrum trading with regulatory approval; new licenses should contain the same provisions.

The regulator should expand the use of unlicensed spectrum to the maximum extent possible.

Tariffs and Pricing

The regulator should undertake tariff rebalancing in order to deter cross-subsidization.

EFFECTS OF TECHNOLOGICAL CHANGES ON REGULATION

This section provides background to the discussion of regulation required in response to the introduction of competition in the fixed line markets. The ICT sector has been drastically altered by the emergence of Internet Protocol ("IP"), new infrastructure and convergence of networks and services.[1] These changes give rise to new ways to regulate a competitive market.

Internet Protocol. The deployment of IP enables the separation of the transmission layer and the service and application layer.[2] The focus of regulation is now on the infrastructure level. Digitalization of the networks has produced many technological developments and industry changes, such as the spread of broadband, significant reductions in international calling prices and telecommunications charges generally, new industry participants, etc:[3]

New Infrastructure. Technological changes enable existing infrastructure, such as power lines and cable TV, to provide ICT services, while new infrastructures, such as WiFi/WIMAX, optical fiber and hybrid optical and electrical infrastructures provide new ways of reaching end users. This new infrastructure results in

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[1] Jerome Bezzina and Mustafa Terrab, "Impacts of New Technologies on Regulatory Regimes," pp. 15-130 in Communications Strategies, Special Issue (Nov. 2005) at 18 ("*Bezzina and Terrab*"), available at http://www.infodev.org/en/Publication.1.html.

[2] *Id*.

[3] See OECD Working Party on Information Economy, "The Future of Digital Economy: Digital Content Creation, Distribution and Access," (January 2006)," DSTI/ICCP/IE(2006)2/FINAL 2 Nov 2006, available at www.oecd.org/sti/digitalcontent.

larger transmission paths and more efficient digital throughput, more efficient and higher capacity switching technology and more efficient software for managing networks, routing information and transforming it into usable formats. It also makes market entry faster and cheaper.

Convergence. The result of these developments is convergence. Specifically, with regard to transmission networks, the following chart demonstrates how multiple services can be provided through technically different transmission networks.

Infrastructure	Voice	Data	Video
Copper line or optical fiber	Public switched, VOIP	DSL, FTTP	VOD, IPTV
Cable	Public switched, VOIP	Cable modem	Analogue, DTV
Mobile	Analogue, 2G, 3G	2.5 G, 3G	DVB-H, others
Fixed Wireless	VOIP	Proprietary, 3G, WiMax, LMDS, MMDS	DVB
Powerline Communications	VoIP	BPL	VOD, DVB, IPTV

DSL=Digital Subscriber Line, FTTP=Fiber to the premises, VOD=Video on Demand, IPTV=Internet Protocol TV, DTV=Digital TV, DVB=Digital Video Broadcasting, 2G = Second generation mobile service, 3G=Third generation mobile service, BPL=Broadband over Power Line.

This chart is taken from InfoDev, "ICT Regulation Toolkit: Legal and Institutional Framework" ("ICT Toolkit"), Module 6, Table 4-1, available at http://www.ictregulationtoolkit.org/en/Section.2084.html.

Convergence can be categorized in four ways:[4]

Service provider convergence – multiple types of providers develop capabilities to offer a service that previously could be offered by only one type of provider – cable TV operators employ VOIP to provide voice service; telecom operators provides video services.

Terminal equipment convergence – customer premises equipment is integrated so that end users receive a variety of services that previously required separate terminals, such as use of a PC to receive broadcast content over the internet; use of a 3G mobile handset to access the internet

[4] ITU Trends in Telecommunication Reform 2004/2005, "Licensing in an Era of Convergence" (2004) ("*ITU Telecom Trends 2004*") at 82.

Convergence of modes of delivery – transmission platforms allow the use of various last-mile technologies to offer a variety of ICT services – DSL, cable modem or satellite platforms to provide voice, data, and video.

Market-related convergence – merging of previously separate market segments into a combined market for substitutable services. Previously non-competing entities – cable TV and telephone companies – enter each other's market.

The Effect of Convergence on Government Policy

The convergence of telecom, information technology and broadcasting has resulted in comprehensive rethinking of laws and regulations. The traditional legal framework has been overhauled in numerous countries. An early regulatory overhaul occurred in the European Union which dramatically altered its fundamental legal framework in 2002, noting that the convergence of the telecommunications, media and information technology sectors means all transmission networks and services should be covered by a single regulatory framework.[5]

To that end, the Framework Directive broadly defines electronic communications networks and services.[6]

Networks include any transmission system which permits the conveyance of signals by wire, by radio, by optical or by other electromagnetic means, including satellite networks, fixed and mobile terrestrial networks, networks used for radio and television broadcasting and cable television networks.

Electronic communications service means a service, normally provided for remuneration, which consists in the conveyance of signals on electronic communications networks.

Azerbaijan has followed the European Union model of defining telecommunications broadly. But then Article 21 of the Telecom Law specifies narrow categories of services for licensing. Based on the definition in the Telecom Law, Azerbaijan should take into account the following principles in revising its regulatory regime to reflect the end of monopoly services:[7]

- Be balanced, clear, consistent, predictable, comprehensive and transparent
- Ensure consistent regulatory treatment of essentially similar services
- Be technology and platform neutral
- Be pro-competitive
- Be flexible enough to adapt to new developments (in technology and services) and to reflect different perspectives of providers and consumers.

PRIVATIZATION AND FOREIGN OWNERSHIP

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5 Directive 2002/21/EC on a Common Regulatory Framework for Electronic Networks and Services (Mar. 7, 2002) (the "*Framework Directive*"), at para. 5 , available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:108:0033:0033:EN:PDF.

6 Id. at Art. 2.

7 *ITU Telecom Trends 2004* at 85.

This section discusses the relationship between privatization of state-owned enterprises ("SOEs") providing telecommunications services and the introduction of competition in the telecommunications market. It provides information about international experience with privatization.

Trends in Privatization. There have been dramatic changes in ownership over the past 20 years. Only 34 percent of incumbents remain State-owned.[8] Ownership in some of the CIS states is shown in the table below.

Country	**State ownership**
Russia	Svyazinvest (holding company for Rostelecom and other providers) – 75% government owned
Georgia	Former incumbent now privately owned
Ukraine	UKRtelekom is 93% privately held
Armenia	Armentel - 90% privately held
Moldova	Moldtelecom - 100% state-owned
Kazakhstan	KazakhTelecom – 51% state-owned
Kyrgyzstan	Kyrgyztelecom, - 90% state-owned

Privatization can be a politically charged exercise and raises significant issues that must be addressed if it is to be successful.[9] The benefits of privatization are spread through the economy and society and are slow to appear. In contrast, the costs are much clearer and concentrated. If the government has been subsidizing prices for local service, there will have to be tariff rebalancing which will increase local calling prices. If the company has a bloated bureaucracy, there could be layoffs, relocation, loss of fringe benefits, etc. These losses are easy to quantify and the affected workers can be a loud voice in opposition to any privatization.

These downsides of privatization can be addressed by social welfare policies and compensation to workers. Tariff rebalancing can be phased in over a period of time and supported by assistance to those most directly hurt by price increases. Workers can be assisted through severance pay, training programs, redeployment to other government jobs and transferable pensions or enticed through stock options and

[8] ITU, "Trends in Telecommunications Reform, 2010-2011," ("*ITU Telecom Trends 2010*"), available at http://www.itu.int/net/itunews/issues/2011/03/04.aspx. In contrast, in 1991, fewer than 20 ITU members had begun the process of divesting government ownership of the monopoly or incumbent telecom operator. *ITU Telecom Trends* 2004 at 4.

[9] Sunita Kiker and John Nellis, "An Assessment of Privatization," World Bank Research Observer, Vol. 19, No. 1, pp. 87-118, Spring 2004 ("*Kikeri and Nellis 2004*") at 104-5, available at http://rru.worldbank.org/Documents/papersLinks/kikeri-nellis.pdf.

share issues. For example, following the partial privatization of Telekom Malaysia, the company adopted special pension provisions to safeguard the pension rights of the employees. The privatized company can create subsidiaries to perform special functions, such as ducting and maintenance and transfer employees to those subsidiaries.[10] This is what PCCW-HK and NTT did. PT Telkom in Indonesia required its joint venture partners to employ surplus staff.

Other objectives which a government hopes to achieve by acting as the telecom operator can also be satisfied through other mechanisms. National security and law enforcement interests can be addressed by policies imposing certain obligations on an operating company. For example, the laws of the United States and of several European countries require that a foreign company seeking to provide service between such country and foreign points have a contact point in the country for wiretapping and other law enforcement requests.

The need to generate revenue can be addressed, for example, through taxation of operators or through frequency auctions. Experience has shown that competition in the sector increases overall revenue, even if revenue derived from traditional voice traffic decreases. The OECD Communications Outlook 2011 states that between 2000 and 2009 the top 100 global telecommunications companies experienced a compound annual growth rate of eight percent in terms of revenues and 12 percent in terms of net profits.[11]

Similarly, the desire to provide universal access or service can be supported in a number of different ways. First, competition itself actually helps improve coverage. Second, there are numerous examples from countries which have tackled the issue of providing universal access or service that can be followed. For example, Chile auctions off subsidies to support service in rural and under-served areas; the Philippines requires rural build-out as part of the license conditions.[12] Similar build-out requirements have been imposed under many telecommunications licenses in developing countries (e.g., Vanuatu, Peru, and Bolivia).

Other concerns, such as the size of initial investments and the need to obtain economies of scale, have been overtaken by technological changes. Technical barriers to entry in the telecommunications sectors have fallen significantly as a result of reductions in equipment costs and the ability to provide service through many different technologies.

Is Privatization Necessary? There are some government-owned corporations that operate efficiently and based on market principles. But a government with an ownership interest in one or more of the operators is unlikely to apply a full package of reforms that are needed to achieve full competition.[13] Investors are less likely to invest in a market dominated by a government-owned incumbent for fear that the government will not force the incumbent to provide access to and use of the incumbent's network on

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10 *Ure 2004* at 46.

11 OECD Communications Outlook 2011 at 31 available at http://www.keepeek.com/Digital-Asset-Management/oecd/science-and-technology/oecd-communications-outlook-2011_comms_outlook-2011-en.

12 *Ure 2004* at 125.

13 *Id*.

terms and conditions that support competition.

Empirical studies have concluded that privatized and private firms perform better than SOEs -- a conclusion that crosses market sectors and applies to companies in developed as well as developing countries. A review of numerous studies of privatized companies concludes that privatization:

- improves a company's operational and financial performance
- provides positive fiscal benefits and higher growth
- contributes to improvement in overall social welfare and
- does not contribute to unemployment and may in fact lead to increases in employment.[14]

The sequencing of privatization, regulatory reform and competition is an important policy decision. International experience shows that countries that have introduced competitive provision of telecommunications services under a strong regulatory framework have seen far more rapid rollout of infrastructure than non-competitive markets,[15] regardless of whether the incumbent has been privatized. Privatization of the incumbent into a competitive regime contributes to leveling the playing field for competitors, redirects government efforts toward policy and regulation, increases the efficiency of the major operator and provides additional avenue for private financing.[16]

No matter when privatization occurs, it is essential that Aztelecom and Baktelecom become functionally separate from MCIT, including with separate personnel and revenue.

Privatization and Foreign Ownership Limitations. Some governments have limited foreign investment in formerly state-owned incumbent operators, while at the same time allowing 100% foreign ownership in non-SOEs. A review of CIS countries which have introduced competition and joined the WTO shows that Russia, Georgia, Ukraine, Moldova, Armenia and the Kyrgyz Republic do not have any limitations on foreign ownership.

There is considerable evidence that liberalizing foreign investment restrictions brings demonstrable economic benefit through increasing competitive pressure on all participants in the market.[17] Having

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[14] Sunita Kikeri and John Nellis, "Privatization in Competitive Sectors: The Record to Date," World Bank Policy Research Working Paper 2860 (June 2002) ("*Kikeri and Nellis 2002*") at 12-13, available at http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2002/08/02/000094946_02072209183311/Rendered/PDF/multi0page.pdf. See also, Guriev, Sergei and Megginson, William, " Privatization: What Have We Learned?," (January 2005), available at http://siteresources.worldbank.org/DEC/Resources/84797-1251813753820/6415739-1257192350745/gurievmeggison.PDF.

[15] "Financing Information and Communication Infrastructure Needs in the Developing World: Public and Private Roles," World Bank Working Paper No. 65 (2005) *("WB Paper No. 65")* at 10, available at http://www.ictliteracy.info/rf.pdf/financingICT_Draft.pdf. . See also Rivera, Eugenio, "Models of Privatization and Development of Competition in Telecommunications in Central America and Mexico," in Schatam, Claudia and Rivera, Eugenio, Ed., Competition Policies in Emerging Economies: Lessons and Challenges from Central America and Mexico, International Development Research Centre (2008), available at **http://web.idrc.ca/openebooks/401-7/**.

[16] *WB Paper* No. 65 at 15.

[17] Canada Competition Policy Review Panel, "Compete to Win" (Sept. 2008), at 47, available at http://www.ic.gc.ca/eic/site/cprp-gepmc.nsf/vwapj/Compete_to_Win.pdf/$FILE/Compete_to_Win.pdf.

conducted a major policy review on the subject of whether to remove restrictions on foreign investment in the telecom sector in Canada the Review Panel reached a number of conclusions. It stated that "foreign investment restrictions reduce competitive intensity in a number of ways that are well known."[18] These include:

- Limiting the sources of finance available to existing operators
- Increasing the cost of capital
- Placing potential new entrants at a disadvantage relative to the incumbents
- Preventing the transfer of the latest technology into the marketplace
- Removing pressure on existing operators to reduce or eliminate inefficiencies in their business practices.

Canada estimated that the effect of foreign ownership restrictions increased the cost of capital by at least $1.06 per month per subscriber for an incumbent telephone company and $2.61 per month per subscriber for Canadian cable companies.[19] In the end, Canada exempted the three major Canadian companies by removing foreign ownership limits for all telecom carriers with less than 10% of the national market and for new entrants.[20]

As of 2009, there are virtually no barriers to foreign investors in three quarters of the countries worldwide and a further five percent allow for a foreign controlling interest.[21]

Recommendations

The introduction of competition should proceed, regardless of the timing of privatization of state-owned operators.

Azerbaijan should separate Aztelecom and Baktelecom functionally from MCIT, including personnel and revenue.

Azerbaijan should maintain its openness to foreign investment and not limit ownership in the ICT sector.

LICENSING IN A CONVERGED WORLD

Licensing is the most obvious area affected by convergence and one of the keys to success in opening the market to competition and innovation. Authorizations provide the basic certainty and legal security investors and lenders need to invest the huge amounts of money necessary to install or to upgrade telecoms infrastructure. Detailed and numerous licensing requirements contribute to bureaucratic delays

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[18] *Id*.

[19] D.G. McFetridge, "The Role of Sectoral Ownership Restrictions," prepared for the Canadian Competition Policy Review Panel (March 2008) at 16, available at http://http-erver.carleton.ca/~dmcfet/personal/Microsoft%20Word%20-%20Foreign%20Ownership%20Restrictions.4.pdf.

[20] McCarthy Tetrault, "Canadian Government Relaxes Telecom Foreign Ownership Restrictions and Sets Rules for 700 MHz Spectrum Auction" (May 4, 2012), available at http://www.mccarthy.ca/article_detail.aspx?id=5862.

[21] *ICT Regulatory Trends 2010* at 4.

and increased opportunities for arbitrary action or corruption on the part of regulators. Narrowly drawn licenses inhibit business expansion and evolution.

The ITU has identified two basic trends in service authorization reform. The first consists of simplification of authorizations, focusing on the services being provided and NOT the technological means of delivery. Simplification "involves the consolidation of different services in a generic categorization or the unification of all services under a single license or concession, what is often called a unified license."[22]

The second reform results in the reduction or elimination of the administrative and formal requirements for authorizations. In some cases, this allows for general licenses that govern a wide range of services, for more services to be provided through notification or registration and, in some cases, for deregulation of services so no authorization, notification or registration is required.[23]

The ICT Toolkit reflects these two trends in describing approaches to licensing:[24]

- introducing technology-neutral authorizations that combine converged services or broaden the types of services that fall within one authorization;
- establishing a unified and technology-neutral license that allows operators to provide multiple services under one license using any kind of technology;
- "de-licensing" whereby the operator merely needs to submit a notification or registration with the regulator, although specific rights of use may be required when scarce resources such as spectrum or numbering are involved in the provision of a service; and
- not requiring any registration or notification because regulation is deemed not to be necessary.

Simplification of Authorizations – Technology Neutral. Many countries now grant authorizations that are technology neutral. This allows the service provider to choose which technology and equipment it will use to provide the authorization service. For example, fixed voice services can be provided through use of VSAT, mobile or fixed lines; mobile services can use GSM or CDMA technology.

Georgia, Armenia and Moldova have drastically simplified their licensing regime to incorporate technology neutrality. Georgia, for example, has only one type of license, an "electronics communications" license, plus a spectrum license; Armenia has two kinds of license, network or services, plus a spectrum license. Moldova has only one type of authorization, plus a spectrum license.

Another example of technology neutral licensing is that used by the Eastern Caribbean Telecommunications Authority (ECTEL). ECTEL uses four categories of licenses:

- Individual Licenses (generally for services that are infrastructure-oriented, such as mobile or fixed public services, submarine cable, internet network);

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[22] ITU-D Study Group 1, "Question 10-2/1: Regulation for Licensing and Authorization of Converged Services," Document 1/251-E (Sept. 2009) ("*ITU Question 10-2/1*") at 2, available at http://www.itu.int/ITU-D/treg/Events/Seminars/GSR/GSR09/doc/STudyGroup_draftreportQ10.pdf. Much of this section derives from *ITU Question 10-2/1*.

[23] *Id*.

[24] *ICT Toolkit*, Module 3, § 1.6.

- Class Licenses (e.g., ISPs, resale, value-added services, private networks);
- Frequency Authorization Licenses (that is an ancillary license that would be required in addition to an Individual or Class License); and
- Special Licenses (that are foreseen for special cases in emergency circumstances).

ECTEL classifies licenses based on the service that will be provided without regard to the type of technology being used.[25] For instance, whereas previously an operator might obtain a VSAT license, it now obtains a license for the service (*i.e.*, a private or a public network service) it will be offering using that VSAT.

Singapore has reduced its authorizations to only two: a facilities-based operator ("FBO") and a service-based operator ("SBO").[26] The FBO deploys its own infrastructure, while a SBO is awarded to companies that provide service over a third party's network, such as Internet access providers or resellers.

Simplification of Authorizations - Unified Licenses. A unified license allows a licensee to provide a variety of services, regardless of the service or technology. The European Union was among the first to adopt this form of licensing, pursuant to its 2002 Directive.[27] The unified license authorizes both services and networks: it allows the provision of any kind of telecommunications service and the deployment and operation of any telecommunications network. A specific, independent permit is required to use spectrum for the service or network.

Moldova has adopted a unified license. It issues a "general authorization" for all service, enabling operators to provide fixed, mobile, internet access or anything else under the same license. Individual licenses are only needed for spectrum, numbers and TV channels.

Reduction or Elimination of Entry Requirements. As noted above, the second trend in licensing relates to reduction or elimination of licenses and authorizations. This results in three categories of authorizations: individual license, general or class license and registration/notification requirements.

Individual Authorizations. According to the ITU Toolkit, individual authorizations have the following characteristics:[28]

- issued to a single named service provider
- usually a customized authorization document
- used most often in a monopoly market
- often contains detailed conditions
- most used in countries where the regulatory regime is still maturing

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[25] ECTEL, "Guidance Notes: Application for a Telecommunications License," Sept. 11, 2002, at 5, available at http://www.ectel.int/Regulatory%20Framework/LicensingGuidancNotesRevisedSept112002.pdf.

[26] See Infocomm Development Authority, http://www.ida.gov.sg/Policies%20and%20Regulation/20060419203000.aspx.

[27] *Framework Directive.*

[28] *ITU Toolkit*, Module 3, § 1.6.1.

- frequently granted through some form of competitive selection process.

Examples include mobile phone services or other services requiring spectrum and the public-switched network. The ICT Toolkit notes that an individual authorization is most useful where: 1) services are using scarce spectrum resources; 2) an exclusive right is to be authorized (e.g., spectrum); and/or 3) the regulator has a significant interest in ensuring that the service is provided in a particular manner (e.g. where the service provider has significant market power).

General or "class" authorizations. Many countries no longer issue individual authorizations for many services. De-licensing involves a general authorization or class license system in which operators are free to provide services subject to regulatory obligations.

Services that are commonly offered by general authorization – and not individually licensed -- include the following:[29]

- Internet Service Provider (ISP) services;
- International services;
- Value-added services, including information content services, intelligent digital network features (e.g. voice-mail, call-forwarding, call-waiting, audio-conferencing, etc.);
- Internet content and transmission services, including e-mail;
- Resale-based services, such as calling card services, call-back services, pay phone and public call office services and, sometimes resale-based IP voice services;
- Private networks, including private virtual networks and private facilities-based networks (except for radio spectrum authorizations, which are usually granted on an individual basis, except for shared bands); and
- Customer terminal equipment, including VSAT terminals, PBXs, routers and all data processing equipment.

There are two ways a general authorization can be "awarded." Some countries require a notification before, or within a short time after, the operator initiates service. Operators do not have to wait for approval before commencing service. Other countries use a registration regime, which requires prior acceptance of the registration by the regulator before the operator can commence its activities. In both cases, the amount of information required is minimal, covering such things as name, address, contact point for inquiries from the regulator or consumers, and name of officers and directors.

The United States, for example, employs a notification regime for operators providing fixed line domestic long distance service. Under FCC regulations, any person that wants to provide domestic interstate service can do so "as long as it obtains all necessary authorizations from the Commission for use of radio frequencies."[30] Operators need to notify the FCC prior to commencing service but no FCC action is required.

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29 *ICT Toolkit*, Module 3, §1.6.1.

30 47 CFR Sec 63.01.

In April 2004, Japan established a registration and notification regime. Operators in Japan that install networks of a certain size and scale must obtain a registration from the Ministry for Internal Affairs and Communications. The Ministry can deny registration to persons who have previously lost their license or been convicted of violating the telecommunications laws or "where it is deemed that the launch of telecommunications services of said person is inappropriate for the sound development of telecommunications."[31] All other operators are only required to submit a notification to the Ministry. Moldova's general authorization is subject to registration with the regulator.

The members of the European Union have perhaps gone farther than most in "de-licensing." The legal framework mandates the replacement of individual licenses by general authorizations, except where the authorization is linked to the use of spectrum or numbers.[32] As a result, a telecommunications service provider may be required to submit a notification that it is providing services, but it may not be required to obtain a decision or be dependent on any other administrative act by the national regulatory authority before commencing operations under the authorization.[33]

The Authorization Directive states that:

Notification shall not entail more than a declaration by a legal or natural person to the national regulatory authority of the intention to commence the provision of electronic communications networks and services and the submission of the minimal information which is required to allow the national regulatory authority to keep a register or list of providers of electronic communications networks and services. This information must be limited to what is necessary for the identification of the provider, such as company registration numbers, and the provider's contact persons, the provider's address, a short description of the network or service, and an estimated date for starting the activity.[34]

Eliminating Licensing Requirements. A final alternative is to drop the licensing requirement and treat the service as a general business service. The fact that a service provider does not receive an individual license – or any license at all – does NOT mean that the service provider is free from all regulation or from paying annual fees. At the same time as a country adopts a simplified licensing structure, it can also put in place a revised regulatory framework to achieve the social and other policy objectives that were previously included in individual licenses.

The United States has taken this approach with respect to internet service providers, providing email, internet access and VOIP. While these service providers do not require an authorization, they are subject to numerous obligations if they provide facilities-based broadband Internet access and VOIP which is

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[31] Telecommunications Business Law (Law No. 86 of Dec. 25, 1984), as amended by Law No. 125 of July 24, 2003, Art. 12, available at http://www.soumu.go.jp/joho_tsusin/eng/Resources/laws/2001TBL.pdf

[32] Directive 2002/22/EC on the Authorization of Electronics Communications Networks and Services (Mar. 7, 2002), available http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:108:0021:0021:EN:PDF.

[33] *Id*. at Art. 3.

[34] *Id*.

connected to the public switched network. These obligations relate to law enforcement,[35] service to persons with disabilities,[36] provision of emergency calling[37] and contributions to universal service funds.[38]

The European Union Authorization Directive lists 18 types of conditions that regulators can adopt for general authorizations where an individual license is not required, such as:

- information collection
- protection of essential security interests,
- safeguarding public safety
- providing services to persons with disabilities
- requiring non-discriminatory treatment of other service providers
- requiring interconnection with other service providers
- contributions to universal service funds
- payment of annual "regulatory" fees
- consumer protection
- requiring publication of tariffs for services offered to consumers
- protecting privacy and personal data.

Best Practices. ITU Study Group 1 agreed upon the following set of principles "when transitioning to and adopting a converged licensing framework:"

- Fostering technology neutrality
- Ensuring flexibility to allow the new licensing regime to accommodate future technological and market changes
- Simplifying the number of license categories
- Reducing administrative burdens and fees on market players
- Applying incentive mechanisms that encourage existing operators to transition to the converged licensing framework, e.g., fee holiday
- Ensuring transparency with regard to converged licensing responsibilities
- Fostering close collaboration amongst appropriate entities with regulatory and oversight responsibilities regarding a converged licensing framework
- Referring to international best practices and international regional organizations to help harmonize licensing approaches."[39]

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[35] Communications Assistance for Law Enforcement and Broadband Access and Services, *Second Report and Order and Memorandum Opinion and Order*, FCC 06-56 (Rel. May 12, 2006), available at http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-06-56A1.doc.

[36] IP-Enabled Services, *Report and Order*, FCC 07-110 (Rel. June 15, 2007), available at http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-07-110A1.doc

[37] E911 Requirements for IP-Enabled Services, *First Report and Order and Notice of Proposed Rulemaking,* FCC 05-116 (Rel. June 3, 2005), available at http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-05-116A1.doc.

[38] Universal Service Contribution Methodology, *Report and Order and Notice of Proposed Rulemaking*, FCC 06-94 (Rel. June 27, 2006).

[39] *ITU Question 10-2/1* at 16.

RECOMMENDATIONS

Azerbaijan should adopt a unified licensing system with three types of licenses:

- Individual network license -- to the extent that Aztelecom and Baktelecom enjoy monopoly rights, these should be specified in the individual network licenses
- Class license to provide services, requiring registration
- Individual spectrum license

The regulator should have the authority to approve registrations and issue all individual licenses and licenses assigning spectrum.

All the licenses should be subject to standard terms and conditions along the lines proposed by the European Union Directive.

General licenses should have no term; individual and spectrum licenses should have a term of 15 years.

ASYMMETRIC REGULATION AND COMPETITION SAFEGUARDS

This section discusses asymmetric regulation and competition safeguards in light of the end of monopoly services. An area of major concern in creating a competitive market is the market power of the incumbent operator. Most countries have adopted asymmetric regulation, imposing additional regulatory obligations on operators with market power. These obligations reflect the requirements in the WTO Reference Paper which Azerbaijan will include as part of its commitments with respect to telecommunications services.

Application of Asymmetric Regulation. The following are general principles that characterize asymmetric regulation:

- Determine the rules of the game before licensing competitive service providers–prescribe clear and realistic conditions for easy entry of operators at various levels from network operations to individual value-added services
- Prevent or correct possible abuses of market power by the dominant telecommunication service provider
- Enable new service providers to become operational, protect new entrants from unhealthy competitive practices, and prescribe suitable conditions for interconnection with the networks of the dominant operator(s)

In liberalizing its telecom market and adapting a new regulatory framework, Azerbaijan must decide how to define the service providers who will be subject to more regulation. The WTO Reference Paper speaks of a "major supplier," which is defined as a company that controls essential facilities or has the ability to materially affect the terms of participation in the market for telecommunications services.[40] Obviously,

[40] Reference Paper, Definitions.

Aztelecom and Baktelekom are "major suppliers" in their respective services areas. As their market position will change over time, however, Azerbaijan needs to define "major supplier" in a manner that can be applied over the long term.

The only WTO dispute settlement panel to interpret the Reference Paper adopted a standard anti-trust analysis in determining whether the company at issue in that case was a major supplier for purposes of applying the Reference Paper obligations.[41] The WTO Panel applied a "demand substitution" test which requires the decision-maker to define 1) the product (or service in the case of telecom) and 2) the geographic area in which the product or service is sold. Doing a true market analysis requires consideration of numerous factors,[42] such as:

- market share
- barriers to entry
- the overall size of the firm
- technological advances or superiority
- the absence of or low countervailing buying power
- easy or privileged access to capital/financial resources
- economies of scale
- vertical integration

It is a time and resource-consuming exercise. It is not really necessary in the early stages of competition when the chief objective is to promote competition by facilitating access to the existing network. Instead, many countries have defined "market power" or a "dominant" operator in terms of market share. For example, in the years following the opening of the market to competition, European regulators applied ex ante regulation to any operator with a market share of 25% or more (termed "significant market power").[43] Although the European Commission no longer applies the 25% threshold,[44] other countries continue to rely on market share as the defining characteristic. For example, South Africa says that a firm with 35% market share presumptively has market power.[45] In general, a market share of 40% to 50% indicates a dominant market position.[46]

In Azerbaijan, the Anti-Monopoly Law defines a company with a market share of 35 percent or more as having a dominant position. This bright line should also be used for purposes of applying asymmetric

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41 "Mexico — Measures Affecting Telecommunications Services," WT/DS204/R (2004) ("*U.S.-Mexico Panel Report*"), available at http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds204_e.htm.

42 *See* Eric Lie, "Competition Policy: Background Paper" (Nov. 18, 2002) ("*ITU Background Paper*"), at 12 –13, available at www.itu.int/osg/spu/ni/competition.

43 *See* Art 4(3) of Directive 97/33/EC of the European Parliament and of the Council of 30 June 1997 on Interconnection in Telecommunications, available at www.dcmnr.gov.ie/NR/rdonlyres/498F8BE3-A061-48B3-843B-05C807ED00FC/0/Comms_Reg_1997_33.doc.

44 *See* Art. 14(2), Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a Common Regulatory Framework for Electronic Communications Networks and Services, OJ L 108/33/24.04.2002.

45 *See ITU Background Paper* at 20.

46 *Id*. at 13. The European Court of Justice has found that there is a presumption of market dominance, in the absence of evidence to the contrary, if a firm has a market share consistently above 50%.

regulation in the ICT sector.

Competition Safeguards. The Reference Paper requires a WTO member to apply competition safeguards to a major supplier. Section 1.1 states that:

Appropriate measures shall be maintained for the purpose of preventing suppliers who alone, or together, are a major supplier from engaging in or continuing anti-competitive practices.

The Reference Paper provides some examples of anti-competitive practices – cross-subsidization, improper use of information, failure to make available information about the network -- but this list is not exclusive of the types of behavior that would be anti-competitive and should be prohibited. The U.S.-Mexico Panel Report stated that "anti-competitive" practices include any action that lessens rivalry or competition in the market, such as price fixing and formation of cartels.

The Reference Paper does not define the specific measures that must be adopted to protect against anti-competitive actions. Many countries have adopted measures requiring the structural separation of various lines of business of the incumbents or non-structural accounting separation; prohibiting unauthorized release of competitor's business and marketing plans and requiring public availability of technical and commercial information, such as standards, network changes, additions or deletions, processing requests, timing changes and billing arrangements.

Although not explicitly required by the Reference Paper, it is essential that the regulatory authority have the ability to enforce these competition safeguards. The case of Mexico is instructive in this regard. Reporting on a review of the telecom market in Mexico, the Organization of Economic Cooperation and Development ("OECD") attributed the lack of competition in the market, more than ten years after competition was allowed, among other reasons, to the lack of enforcement of the existing competition safeguards. The OECD Report noted that COFTEL, the regulator, "lacks sufficient enforcement power and autonomy to perform its role."[47]

RECOMMENDATIONS

The regulator and the Ministry of Economic Development Anti-Monopoly Office should reach an agreement dividing responsibilities.

The regulator should adopt a bright line test of 35 percent market share for application of asymmetric regulation.

The regulator should begin defining relevant markets, looking to the European Union market definitions as a substitute for a full-blown market analysis.

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[47] OECD, "Review of Telecommunication Policy and Regulation in Mexico," at 12, OECD Publishing (2012), available at http://dx.doi.org/10.1787/9789264060111-en.

The regulator should designate Aztelecom and Baktelecom as "major suppliers" in the fixed line wholesale and retail markets, and mobile call termination market and begin analyzing their market share in the other markets.

The regulator should examine the market share of other operators to determine whether they exceed the 35% threshold.

The regulator should adopt rules prohibiting the types of anti-competitive activities, such as a requirement for accounting separation, cross-subsidization, prohibitions on improper use of confidential information, etc., which are not contained in the Anti-Monopoly Law.

As soon as adopted, these rules should be applied to Aztelecom and Baktelecom, particularly the requirement for accounting separation and prohibition of cross-subsidization.

In order to ensure that Aztelecom and Baktelecom do not improperly cross-subsidize, the regulator should order each to institute accounting separation.

The regulator needs to have enforcement powers, including the power to revoke a license and impose penalties of an operator for failure to comply with competition safeguards and other terms/conditions of its license.

INTERCONNECTION AND ACCESS IN COMPETITIVE MARKETS

Traditional Interconnection Issues.

The development of downstream competition in telephone markets depends upon the ability of market entrants to access incumbent networks at reasonable prices, terms and conditions. An incumbent operator, a "major supplier" in terms of the WTO Reference Paper, has no incentive to facilitate entry by its competitors. In fact, an incumbent can easily place various obstacles in front of new entrants:

- The incumbent may refuse to grant interconnection.
- The incumbent may offer interconnection at rates and on terms that make it difficult for the competitor to interconnect.
- The incumbent may offer interconnection services to the competitor that are of lower quality than what the incumbent provides to its affiliated entities.

The importance of interconnection is reflected in the detailed requirements of the WTO Reference Paper. Interconnection is defined very broadly to cover all types of basic telecommunications services that are included in a WTO Member's Schedule. Specifically, it applies to the "linking with suppliers providing public telecommunications transport networks or services in order to allow the users of one supplier to communicate with users of another supplier and to access services provided by another supplier, where

specific commitments are undertaken."[48] The Reference Paper goes on to describe the interconnection obligations of a "major supplier." Interconnection must be provided:

- at any technically feasible network point
- under non-discriminatory terms, conditions and rates
- of a quality no less favorable than that provided for its own like services or for like services of non-affiliated suppliers or for its subsidiaries or other affiliates
- in a timely fashion
- on non-discriminatory terms, conditions and rates
- at cost-oriented rates
- sufficiently unbundled so that the supplier need not pay for network components it does not need
- on request, at network termination points other than those offered most users, subject to reasonable charges.

Other provisions of the Reference Paper also apply regarding interconnection. The procedures applicable to obtaining interconnection to the incumbents have to be publicly available (for example, by posting on a website) and the government must require the incumbents to either publish a Reference Interconnection Offer or make publicly available all their interconnection agreements. Finally, the government has to provide a mechanism for settling disputes over the terms of interconnection that arise between the incumbents and other operators.[49]

The 2005 Telecom Law and Regulations for Utilization of General Communications Network provide for non-discrimination in interconnection, which presumably includes terms, conditions and rates. But there are no provisions on pricing, unbundling, network termination points and interconnection locations.

Scope of Mandated Interconnection. The scope of mandated interconnection can differ depending on whether the regulator wants to promote infrastructure competition or service competition. Many countries opted for service competition on the theory that it enables a new entrant to enter a market and earn revenue while building out its own network.[50] For example, the European Union chose service-based competition over infrastructure-based competition for fixed networks. Having done so, the European Union has mandated access to all network elements.[51] In contrast, the U.S. Federal Communications Commission decided that it wanted new entrants to construct their own infrastructure. Therefore, it defined interconnection narrowly and substantially reduced the number and types of network elements

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[48] Reference Paper, § 2.1, available at http://www.wto.org/english/tratop_e/serv_e/telecom_e/tel23_e.htm.

[49] Reference Paper , §§2.3, 2.4 and 2.5.

[50] The theory was based on the idea of a "Ladder of Investment." Martin Cave, "Encouraging infrastructure competition via the ladder of investment," Telecommunications Policy, 30, 223-237.

2006). For a view that the Ladder of Investment theory is not sound, *see* Marc Bourreau, Pinar Doan, and Matthieu Manant. "A Critical Review of the 'Ladder of Investment' Approach.," Telecommunications Policy 34(11) (2010) 683-696, available at http://nrs.harvard.edu/urn-3:HUL.InstRepos:4777447.

[51] Ewan Sutherland, "Unbundling local loops: global experiences," LINK Centre (Dec. 2007) at 4, available at http://link.wits.ac.za/papers/LINK.pdf. The European experience is discussed below under "Access."

that must be unbundled on a mandatory basis.[52]

Minimum Actions Required. At a minimum, under the Reference Paper, Azerbaijan needs to regulate termination of calls on the incumbent's network, which constitutes a bottleneck facility. This includes not only the "last mile" but also the international gateway to the extent that it remains a bottleneck facility in the absence of competition. Access to the international gateway is particularly important in the development of the ICT sector, given that it is the entry and exit point for all data, voice, video and other broadband services.[53] In the U.S.-Mexico Dispute, the WTO Panel found that Mexico had violated its WTO commitments by failing to require Telmex, a major supplier, to provide termination at cost-oriented prices at its international gateways.[54]

This requires creation of a Reference Interconnection Offer by the incumbents, setting forth interconnection terms and conditions for interconnection services that a competing operator can choose to accept without further negotiation. This is much more complicated than it sounds because it requires a determination about cost-oriented pricing.

The Reference Paper does not specify a method for determining cost and there are a wide variety of methods. The U.S.-Mexico Panel Report states:

Rates that are 'cost-oriented' would not need to equate exactly to cost, but should be founded on cost. The degree of flexibility inherent in the term 'cost-oriented' suggests, moreover, that more than one costing methodology could be used to calculate 'cost-oriented' rates.[55]

Cost can be developed from bottom-up or top-down cost models or from benchmarking rates in similar countries which have used cost models.[56] There are at least three cost models employed by regulators, each of which requires extensive data input and a significant amount of time and resources.[57] According to the ICT Toolkit, benchmarking is an alternative method if there are resource constraints. It involves taking an average of cost-derived interconnection pricing from countries with similar characteristics.

The other element of Reference Paper obligations that requires action is the establishment of a dispute settlement system for interconnection disputes, other than the judicial courts. The ICT Toolkit lists the following typical interconnection disputes:[58]

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[52] *See ICT Toolkit*, Practice Note: United States Unbundling, available at http://www.ictregulationtoolkit.org/en/PracticeNote.2895.html.

[53] *Broadband Strategies Handbook* at 112. This *Handbook* notes that the "most efficient way to lower costs and keep pace with demand is through liberalization and promotion of competition among facilities that provide international connectivity.

[54] *U.S.-Mexico Panel Report* at ¶7.143.

[55] Id. at ¶7.168 (emphasis in original).

[56] *ICT Toolkit*, Module 2, §4.2

[57] *ICT Toolkit*, "Commonly Used Cost Models," Practice Note, available at http://www.ictregulationtoolkit.org/en/PracticeNote.aspx?id=3296. The *ICT Toolkit* contains detailed descriptions of cost modeling and numerous examples from around the world *ICT Toolkit,* Module 2, §4.2.

[58] *Id.* at Box 7-8 and Module 6, § 7.4.1.

- Failure by a dominant operator to develop a Reference Interconnection Offer (RIO) or standard interconnection arrangements
- Failure to conclude negotiations on a timely basis
- Disagreement on interconnection charges
- Disputes over quality of interconnection services
- Failure to comply with the terms of a negotiated interconnection agreement
- Poaching of customers by new entrants through improper customer transfers i.e., slamming
- Improper use of competitively sensitive customer information by incumbent operators.

While the 2005 Telecom Law gives MCIT the authority to settle disputes, as long as Aztelecom and Baktelecom are part of MCIT, it is difficult to view MCIT as an "independent body," as required by the Reference Paper. The need for independence is particularly important because of the harm that an incumbent can cause new entrants. As noted, the incumbent has no incentive to reach agreement with a potential competitor and can refuse or delay negotiations indefinitely.

ACCESS TO INFRASTRUCTURE.

As with interconnection, there are traditional issues associated with access to infrastructure, such as local loop unbundling and access to leased lines. Unbundling has been a focus of regulation in many countries in an effort to provide access to new entrants to facilities that are difficult, if not impossible, to duplicate. With full unbundling, the incumbent must offer a separate fully unconditioned local loop service.[59] Shared access is more limited, requiring access to the non-voice frequencies of a local loop. Bit-stream access is access to links capable of providing high-speed access.

The Telecommunications Regulation Handbook notes that there is much debate about the costs and benefits of mandated unbundling.

Benefits	**Costs**
Increases, and brings forward, entry by reducing entry costs	Potentially high administrative and compliance costs (costs increase with the extent of unbundling)
Increases competition in the provision of services supported by the existing network	May reduce incentives for incumbents to invest in new infrastructure
Can bring forward the introduction of new services that rely on the incumbent's network technology (such as DSL services) and competition in those services	Enables incumbents to obtain legislative and regulatory relief, by making investment in NGN contingent on such relief.

[59] The discussion of unbundling is taken from World Bank, InfoDev, ITU, "The Telecommunications Regulation Handbook – 10th Edition" (2011) ("*Telecommunications Regulation Handbook*") at 125-127.

Benefits	Costs
	May reduce incentives for entrants to invest in new infrastructure.
	Entrants may focus on reselling the incumbent's services, instead of designing innovative new service offerings

There is no agreement on whether the Reference Paper requires any specific type of unbundling. The U.S. FCC has rejected unbundling of local loops in old and new networks. In other countries, when local loop unbundling has been mandated, it usually applies only to the fixed-line copper networks for DSL services. There is no reason why the same range of unbundled products would not apply in a fiber network.[60] In a few countries, Netherlands, Sweden and Slovenia, unbundling applies to newly installed fiber optic networks.[61] As of 2007, Georgia and Moldova had adopted rules mandating local loop unbundling.

Leased lines are another method of providing a competitive service without building out a second network. They are used by new entrants to provide service to end users until it is economical to construct a second network. They are also used by Internet Service Providers (ISPs) to have permanent high-speed access to the Internet. Where the incumbent is vertically integrated and does not provide leased lines at a competitive price, ISPs have a very difficult time entering and remaining in the market.

Mandating provision of leased lines is an obligation that Azerbaijan will undertake as part of its WTO accession. The Annex on Telecommunications, attached to the General Agreement on Trade in Services, provides that "access to and use of" the public network for scheduled services be "on reasonable and non-discriminatory terms and conditions." It goes on to state that service suppliers of any other Member should have access to and use of any public telecommunications transport network or service offered within or across the border of that Member, including private leased circuits.[62]

Unlike interconnection, the prices for leased lines have to be "reasonable," not "cost-oriented." In the U.S.-Mexico dispute, the panel stated that "reasonable" implies "a degree of flexibility that involves consideration of the circumstances of a particular case."[63] The panel determined that Telmex's interconnection charges exceed cost-oriented rates "by a significant margin"[64] and that the uniform nature of the leased line charges excluded competition.[65] As a result it determined that charges for access to the

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60 Tracy Cohen and Russell Southwood, "Extending Open Access to National Fibre Backbones in Developing Countries," GSR 2008 Discussion Paper ("*Cohen and Southwood*"), at 33, available at http://www.ictregulationtoolkit.org/en/Publication.3553.html.

61 *Broadbard Strategies Handbook* at 117.

62 GATS, Annex on Telecommunications, §5(a) and (b).

63 *U.S.-Mexico Panel Report* at ¶ 7.328.

64 *Id*. at ¶ 7.335.

65 *Id*.

network at the border were not "reasonable," thus violating Section 5(a) of the Annex.[66]

EFFECT OF CONVERGENCE ON INTERCONNECTION AND ACCESS.

While this paper focuses on the traditional fixed line interconnection issues which arise in the face of a former monopoly operator, convergence has created a second kind of interconnection and access issues that should be taken into consideration when evaluating regulatory changes.[67] Traditional interconnection is usually charged on a per minute or per second basis, or in the case of mobile networks on a calling party pays/receiving party pays or bill and keep model. In contrast, in an IP-network there is always an alternative path to the destination available and no one single entity has the ability to block connection. Internet traffic through IP-networks is generally exchanged indirectly (transit) or directly through peering arrangements. Traffic is not measured in minutes or seconds and usually there is no charge for this type of interconnection.

The existence of the two kinds of charging arrangements presents the opportunity for arbitrage to avoid paying the traditional interconnection rates and leads to regulatory uncertainty. The U.S. Federal Communications Commission noted in a recent proceeding that "arbitrage schemes cost hundreds of millions of dollars each year and that regulatory uncertainty about whether or what . . . payments are required for VoIP traffic is hindering investment in IP-based products and services."[68] The arbitrage opportunities particularly have an adverse effect on fixed-line incumbents who depend for much of their revenue on interconnection charges. A number of regulators are looking at ways to reconcile the differences. The Body of European Regulators of Electronic Communications has proposed adoption of bill and keep for all termination charges.[69] Having noted the problems of arbitrage and uncertainty, the U.S. Federal Communications Commission has started a public proceeding to adopt a framework for long-term interconnection reform.[70]

The desire to encourage broadband deployment has complicated issues relating to infrastructure access. Regulators have to balance the need to encourage investment in high-speed infrastructure while at the same time promoting competition. The catch-phrase is "open access," defined by InfoDev as:

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66 *Id*.

67 The differences between traditional interconnection and IP-based interconnection is taken from Tim Kelly and Carlo Maria Rossotto, "Broadband Strategies Handbook," World Bank (2012) ("*Broadband Strategies Handbook*"), at 104-111, available at https://openknowledge.worldbank.org/bitstream/handle/10986/6009/676200PUB0EPI0067882B09780821389454.pdf?sequence=1.

68 In the Matter of Connect America Fund: A National Broadband Plan for Our Future, Notice of Proposed Rulemaking and Further Notice of Proposed Rulemaking, FCC 11-13 (2011) ("*FCC 2011 NPRM*") at ¶35, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-11-13A1.doc.

69 Body of European Regulators of Electronic Communications, "Common Statement on Next Generation Networks Future Charging Mechanisms / Long Term Termination Issues," BoR (10) 24 Rev 1 (June 2010), available at http://berec.europa.eu/doc/berec/bor_10_24_ngn.pdf.

70 *FCC 2011 NPRM* at ¶40.

- a technology-neutral framework (that encourages innovative, low-cost delivery to users),
- competition at all layers in the IP network (allowing a wide variety of physical networks and applications to interact in an open architecture),
- transparency to ensure fair trading within and between layers (that allows clear, comparative information on market prices and services),
- the circumstances where everyone can connect to everyone else at the layer interface (so that any size organization can enter the market and no one takes a position of dominant market power), and
- devolved local solutions rather than centralized ones (encouraging services that are closer to the user).[71]

The problem is that in some cases infrastructure to support broadband represents new investments by existing operators who are reluctant to take on the risks associated with an investment and then have to share the facilities with others. In this case, the pricing of any mandate to provide access has to be such that it does not discourage investment. Another tactic is to mandate the separation by the incumbent of its wholesale from the retail business. This goes beyond accounting separation, where the incumbent is required to keep separate accounts for different services. Instead, it is a physical separation of activities. The most famous example is BT, which was required by the UK regulator to split into two companies, one focused on retail operations and the other on wholesale.[72]

In other cases, there are not sufficient resources for infrastructure investment or there are areas of low population density or geographic remoteness, where construction of network facilities is not commercially viable. This has led some countries to "remonopolize" the fixed broadband infrastructure network and then mandate access to that network. For example, Tanzania has built a fiber optic network, managed by the incumbent operator but on an open access basis. The incumbent receives a management fee.[73] Singapore is constructing a government-owned fiber optic network with distinct structural separation from all other operators.[74] While Singapore may not be an appropriate example because of its size and level of development, it is instructive because of its decision that the resources necessary to construct a broadband network could not be raised commercially.

Access to other infrastructure supporting fixed line or mobile services, such as ducts, poles, towers and power supplies has not traditionally been mandated in most countries. Nonetheless, such access has become an essential component of a broadband network and the focus of regulatory attention. One estimate is that the cost per kilometer of laying a fiber optic cable is US$15,000 to $17,000 in rural areas

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[71] InfoDev, "Open Access Models: Options for Improving Backbone Access in Developing Countries (2005) at 19, available at http://www.infodev.org/en/Publication.10.html.

[72] See Tracy Cohen and Russell Southwood, "Extending Open Access to National Fiber Backbones in Developing Countries," GSR 2008 Discussion Paper (2008) ("*Cohen and Southwood*") at 9, available at http://www.ictregulationtoolkit.org/en/Publication.3553.html.

[73] David Rogerson, "Open Access Regulation in the Digital Economy," ITU Global Symposium for Regulators 2011 Discussion Paper ("*Rogerson 2011*"), at 20, Box 4, available at http://www.itu.int/ITU-D/treg/Events/Seminars/GSR/GSR11/documents/02-Open%20Access-E.pdf.

[74] *Id*. at 11-12.

where the cable is buried and US$2,000 per kilometer to string cable in an urban area.[75]

There are benefits to mandated sharing of infrastructure, such as reducing the costs of physical network roll-out and capital and operating expenditures. Other benefits include pooling assets to reach low population density areas or remote geographic regions that might not otherwise be served.[76] Environmental concerns can also be addressed where sharing reduces the numbers of towers or masts needed to achieve the required coverage.[77] Finally, infrastructure sharing leads to more rapid rollout of services.[78]

RECOMMENDATIONS

The regulator should require Aztelecom and Baktelecom to take the following actions:

- produce a RIO which will require developing a cost model
- make publicly available all information about interconnection to their networks
- make available all information about terms and conditions for accessing leased lines.

At a minimum, the regulator should issue interconnection rules regarding the last mile that address issues, such as interconnection points, cost-oriented rates, essential installations, physical collocation, though Azerbaijan could follow the European Union model and mandate local loop unbundling and bitstream access, as well.

The regulator should issue regulations on access to and use of PSTN by all service providers and attachment of equipment to the network, not just licensed operators that applies to all licensed operators and which requires public availability of information.

MANAGEMENT OF COMMERCIAL SPECTRUM

The end of the fixed-line monopoly will create opportunities for new entrants, who may decide to compete using a combination of fixed-line and wireless technology. As a result, Azerbaijan needs to review its licensing of spectrum to make sure that it permits the most efficient use of the resource.

Traditional spectrum licensing exerted a high degree of control on licensees and often required a certain technology.[79] Spectrum assignments originally were made on a case-by-case basis to individual users for specific services and, often, required the use of specified technology. In many cases, regulators controlled

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75 *Cohen and Southwoord.* at 11.

76 *Telecommunications Regulation Handbook* at 129-130.

77 Camila Borba Lefèvre, "Mobile Network Sharing," GSR 2008 Discussion Paper (Feb. 2008) ("*Mobile Sharing*") at 5, available at, http://www.ictregulationtoolkit.org/en/Publication.3985.html.

78 *Id*. at 6.

79 This paragraph is based in part on ITU, Trends in Telecommunication Reform 2004/2005, "Licensing in an Era of Convergence" (2004) ("*ITU Trends in Telecom Reform*"), at 28-29 and 96-100.

entry because of the fear of overbuilding, a desire to promote economies of scale and the need to prevent interference between systems.

With the development of new radio technologies, the dangers of overbuilding are lessened, the potential for certain types of interference has been drastically reduced, the reach of wireless services has been expanded and many more services can be provided in existing spectrum. The key to spectrum management now is to balance the certainty of interference-free spectrum to encourage a stable roll-out of services and flexibility to allow improvements in cost, services and technologies to spread more readily to consumers and public services.[80]

New technologies include:[81]

Software defined radio – wireless terminal that receives its functionality from the software that runs it. A specific type of software defined radio, agile radio, makes spectrum allocation much more efficient because it acts as "frequency scavengers," identifying spectrum that is unused and moving to it when it senses that another device wants to use the frequency on which it is currently transmitting.[82]

Wi-Fi and Wi-Max are widely available and relatively inexpensive.

Fentocells or personal cell phone towers extend the range of wireless networks.

Ultra wideband technology makes use of a very wide range of frequencies to enable use of many different services.

Wireless local loop provides broad spectrum use combined with low power that significantly lessens concerns about interference.

Digital Enhanced Cordless Telecommunications is a recently developed radio technology suited for voice, data and networking applications with range requirements up to a few 100m.

As a result of these new technologies, countries have been adjusting the manner in which they regulate spectrum, authorizing broader use of unlicensed spectrum and permitting spectrum trading and in-band migration, to provide additional flexibility.

Spectrum Trading. Spectrum trading is a mechanism whereby rights and any associated obligations to use spectrum can be transferred from one party to another by way of a market-based exchange for a certain price.[83] Spectrum trading, viewed by many as the key step to be taken in the reform of spectrum management regulatory practice, is capable of unlocking the potential of new technologies and eliminating

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[80] ICT Toolkit: Radio Spectrum Management – Executive Summary (January 2007) at 8, available at http://www.ictregulationtoolkit.org/en/Section.3226.html.

[81] *ITU Telecom Trends 2004* at 98 and *Broadband Strategies Handbook* at 97.

[82] ITU, Background Paper: Advanced Wireless Technologies and Spectrum Management, Document: RSM/08 (February 2004) at 13-14, available at http://www.itu.int/osg/spu/ni/spectrum/RSM-AWT.pdf. Cognitive radio is another name for agile radio.

[83] *ICT Toolkit*, Module 5, §1.5.2.

artificial scarcities of spectrum which find expression in inflated prices for spectrum-using services.[84]

According to the ICT Toolkit, spectrum trading contributes to a more efficient use of frequencies because a trade will only take place if the spectrum is worth more to the new user than it was to the old user, reflecting the greater economic benefit the new user expects to derive from the acquired spectrum. It also has indirect benefits:

- it enables licensees to expand more quickly than would otherwise be the case;
- it makes it easier for prospective new market entrants to acquire spectrum;
- if spectrum trading were combined with an extensive liberalization of spectrum usage rights, there would be a considerable incentive for incumbents to invest in new technology in order to ward off the threat of new entrants in the absence of other barriers to entry (i.e., the unavailability of spectrum); and this, in turn, would boost market competition.[85]

A study[86] done for the European Union on spectrum trading and in-band migration concluded that:

- Spectrum trading and in-band migration will facilitate introduction of new services and promote innovation and without it innovation may move outside Europe.
- Trading will remove barriers to market entry and promote competition in supply of spectrum-derived services.

Flexible Use or In-Band Migration. One way to promote wireless broadband development is to allow flexible use of assigned spectrum.[87] This means allowing wireless providers to offer any type of broadband service or application, whether voice, video or data. For example, operators licensed to provide mobile services can upgrade their networks to provide 3G services without an additional license or approval.

In the EU, the 1987 assignment for Global System for Mobile Communications (GSM) reserved the 900 MHz band for GSM networks and services only. But in 2009, the EU revised its rules to permit greater flexibility in the choice of technology for this band.[88] The 2009 Directive noted:

Flexibility in spectrum management and access to spectrum should be increased in order to contribute to the objectives of the internal market in electronic communications. The 900 MHz band should therefore be open to other systems for the provision of other pan-European services as soon as it can be demonstrated

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84 *Id*. at Practice Note: Spectrum Trading, available at http://www.ictregulationtoolkit.org/en/PracticeNote.3076.html.

85 *ICT Toolkit*, Module 5, §1.5.2.

86 Analysys Consulting Ltd. DotEcon Ltd. and Hogan & Hartson, "Final report for the European Commission, Study on conditions and options in introducing secondary trading of radio spectrum in the European Community" (May 2004), available at http://ec.europa.eu/information_society/policy/ecomm/radio_spectrum/_document_storage/studies/secondary_trading/secontrad_final.pdf.

87 This paragraph is taken from *Broadband Strategies Handbook* at 97.

88 "Directive 2009/114/EC of the European Parliament and of the Council Amending Council Directive 87/372/EEC on the Frequency Bands to Be Reserved for the Coordinated Introduction of Public Pan-European Cellular Digital Land-Based Mobile Communications in the Community" (Sept. 16, 2009), available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:274:0025:0027:en:PDF

that those systems can coexist with GSM systems.

Unlicensed Spectrum Use. There are many uses of spectrum that should not require individual spectrum assignments because they do not raise interference issues. Unlicensed use, also referred to as a "commons" approach, is based on sharing spectrum widely among users without guarantees of interference-free operation.[89] Usually, unlicensed devices are subject to power limits. The traditional unlicensed use has been for industrial, medical and scientific uses, such as computers, cordless telephones, cardiac pacemakers, inventory tracking devices, etc.

Unlicensed uses are now much broader. About 50% of countries have designated the Wi-Fi frequency bands, such as the 2.4GHz range, as exempt from licensing or nearly so.[90] Consumer devices with Wi-Fi functionality surpassed 770 million units in 2010, an increase of near 33 percent compared to 2009.[91] Wi-Fi can also act as a complement to commercial wireless services, expanding the wireless networks and easing congestion.[92]

In recognition of the advancing technologies, the U.S. Federal Communications Commission recently removed the power threshold for unlicensed personal communications services, taking into account the availability of Digital Enhanced Cordless Telecommunications and allowing for expansion of the kinds of services that can be offered.[93] On May 25, 2012, a group established by the U.S. President called on the government to electronically rent or lease spectrum for periods of time as short as seconds using software defined radio, specifically agile radio.[94] According to the press report, the panel concluded that radio spectrum could be used as much as 40,000 times as efficiently as it is currently.

RECOMMENDATIONS

The authority to assign radio spectrum should be transferred to the regulator, with the Frequency Council limited to allocating spectrum for broad uses

Existing spectrum licenses should be amended to permit in-band migration without regulatory approval

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89 Bjorn Wellenius and Isabel Neto, "The Radio Spectrum: Opportunities and Challenges for the Developing World," World Bank Policy Research Working Paper, No. 3742 (October 2005) ("*Wellenius and Neto*"), at 8, available at http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2005/10/04/000016406_20051004135439/Rendered/PDF/wps3742.pdf.

90 ITU, "Beyond Licensed vs. Unlicensed: Spectrum Access Rights Continua" (January 2007), at 6, available at http://www.itu.int/osg/spu/stn/spectrum/workshop_proceedings/Background_Papers_Final/ITU-Horvitz-FINAL.pdf.

91 *Broadband Strategies Handbook* at 102.

92 Id. at 102-103.

93 Amendment of Part 15 of the Commission's Rules Regarding Unlicensed Personal Communications Service Devices in the 1920-1930 MHz Band, FCC 12.33 (Rel. Mar. 23, 2012), available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2012/db0323/FCC-12-33A1.pdf.

94 John Markoff, "Presidential Panel Urges More Flexible Use of Spectrum," New York Times (May 25, 2012), available at http://www.nytimes.com/2012/05/26/technology/presidential-panel-urges-better-use-of-spectrum.html.

and spectrum trading with regulatory approval; new licenses should contain the same provisions.

The regulator should expand the use of unlicensed spectrum to the maximum extent possible.

REGULATION OF RETAIL PRICES

This section deals with retail pricing in light of technological changes noted before and the advent of competition.[95] One of the main characteristics of the technological revolution is the end of distance as a cost factor. With the widespread installation of fiber optic cables, the cost of international calls has dropped dramatically, as evidenced by the falling revenue of incumbent carriers. If the incumbents are subsidizing local charges with international long distance charges, they will no longer be able to do so in a competitive market. The incumbent operators will be forced to develop retail prices which take greater account of the actual costs of providing telecommunication services at both national and international levels. The objective for the Government is to manage the rebalancing so that it does not become a social and political issue.

The objective of retail price regulation is to obtain the pricing that would be expected in a competitive market. According to the ICT Toolkit, there are a variety of schemes to regulate prices that can be introduced, of which price cap is the most popular.[96] It may be that mobile phone prices are competitive enough and sufficiently widespread that affordability is not a question. If this is not the case in Azerbaijan, the Government may consider a phase-in period and direct subsidies to consumers to ensure affordability and geographic uniformity of prices. Alternatively, it can adopt universal service policies that subsidize the operators providing affordable service through auctions.

Tariff rebalancing is a relatively short-term necessity. Many countries have introduced price cap regulation and then removed it when competition increased. Their focus then remained on the wholesale level, on the theory that if prices at that level are cost-oriented, a competitive retail market will not require regulation. Hong Kong, for example, introduced retail tariff regulation in 1995 and then removed it in 2005, noting the persistent market share erosion for the incumbent, the emergence of alternative products and the lower barriers to entry.[97]

QUESTIONS FOR DISCUSSION

The regulator should undertake tariff rebalancing in order to deter cross-subsidization.

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[95] Wholesale pricing has been discussed in the chapter on interconnection and access.

[96] *ICT Toolkit*, Module 2, Sec. 7.1. *See, e.g.*, Price Regulation Framework for Telecommunications Services in Trinidad and Tobago, TATT 2/3/13 (March 2009), available at http://www.ictdec.org/en/regions/region_3/zone_85/database_11/decisions/510/en/510.pdf.

[97] *Id*. at Practice Note: Hong Kong: Price Regulation, available at http://www.ictregulationtoolkit.org/en/PracticeNote.2651.html.